made from a mixture of asphalt and a filler which contains less than about 10% igneous and/or metamorphic rock particles. Preferably, the filler is substantially free of igneous and/or metamorphic rock particles. By using the igneous or metamorphic rock particles as a filler only in the top coating and not in the mat coating, the algae resistance characteristics can be obtained without the increased risk of premature failure.

Any type of suitable filler besides igneous or metamorphic rock particles can be used in the mat portion 14B of the coating. Preferably, the same filler is also used in the bottom portion 14C of the coating. Some nonlimiting examples of suitable fillers include particles of sedimentary rocks or minerals such as limestone, dolomite, silica, talc, shale, clay, or mica. Other suitable fillers include fly ash, carbon black, and inorganic fibers. Typically, the filler comprises sedimentary rock particles. In a preferred embodiment of the invention, trap rock particles are used as a filler in the top coating 14A and limestone particles are used as a filler in the mat coating 14B and the bottom coating 14C.

In another embodiment of the invention, the coating of the roofing material is varied in composition to improve handling and avoid cracking while limiting the cost of the roofing material. Shingle handling (pliability, especially in cold conditions) has become more important with the increased popularity of premium and laminated shingles. The formation of cracks in the top surface of a shingle is the primary symptom of poor cold handling.

Referring again to Fig. 1, the handling of the roofing material 10 is improved by using an asphalt-based coating having a high pliability or flexibility in the top portion 14A of the coating 14. The high pliability of the coating is defined by a pliability test described in CSA Standard A123.5-98, Section 8.5. In this Standard, five machine direction and five cross-machine direction roofing material specimens are tested by bending them over the radius of a mandrel. The

test conditions are the same as described in ASTM Method D228, except that the test temperature is 32°F +/- 5°F (0°C +/- 3°C). and the mandrel radius is 2 inches +/- 1/16 inch (5.1 cm +/- 0.2 cm). A roofing material having high pliability meets or exceeds the pliability requirements of Table 1 in CSA A123.5-98.

One way to increase the pliability of the coating is to use an asphalt in the coating which was treated by ferric treatment during its processing. The ferric treatment produces a softer asphalt. The pliability of the asphalt may also be improved by modifying the asphalt with a rubber material, such as an SBS rubber.

However, the highly pliable coating is usually more costly than a typical asphalt-based coating. Since the formation of cracks in the top surface is the prime symptom of poor cold handling, the highly pliable coating can be used only in the top portion 14A of the coating, not the bottom portion 14C. In some embodiments, the mat portion 14B of the coating also does not have the high pliability.

It should be noted that for purposes of testing the different asphalt-based coatings for pliability according to CSA Standard A123.5-98, separate test roofing materials are produced with the different coatings applied to coat the entire roofing material (top portion, mat portion and bottom portion). The same procedure is used for other tests described below.

In another embodiment of the invention, the coating of the roofing material is varied in composition to provide excellent weathering performance while reducing the cost of the roofing material. Over time, the effects of weather on the coating of a roofing material may cause deterioration of the coating, such as brittleness and cracking. Therefore, it is desirable to provide a coating having the ability to withstand the effects of weather without deteriorating for a long period of time. Weathering performance of coating asphalt is an important

selection criterion, eliminating many lower cost asphalts for use in typical roofing materials.

Fig. 2 illustrates a roofing material 20 according to the invention which has excellent weathering performance while being reduced in cost. The roofing material includes a mat 22 saturated and coated with an asphalt-based coating 24. The coating includes a top portion 24A covering the top of the mat, a mat portion 24B saturating the mat, and a bottom portion 24C covering the bottom of the mat. The top portion 24A of the coating includes a top surface layer 24T. The roofing material usually includes a layer of roofing granules 26 embedded in the top surface layer 24T.

In accordance with the invention, at least the top surface layer 24T of the top portion 24A of the coating passes a weathering performance test as measured by at least 60 cycles-to-failure using ASTM Method D4799, "Standard Test Method for Accelerated Weathering Test Conditions and Procedures for Bituminous Materials (Fluorescent UV and Condensation Method)", published March 2000. The top surface layer is preferably at least about 0.023 inch (0.058 cm) thick. In one embodiment, the entire top portion of the coating passes this weathering performance test. Using Cycle A of the test method, the coating material is exposed to cycles of four hours of UV light at 60°C, alternating with fours hours of condensation at 50°C. The cycles are continued until the coating material fails due to cracking as determined by ASTM Test Method D1670.

However, the roofing material can be produced so that the bottom portion 24C of the coating does not pass the weathering performance test. This allows the use of lower cost asphalts in the bottom portion. In some embodiments, the top portion 24A of the coating except for the top surface layer 24T is also made with a lower cost asphalt, and/or the mat portion 24B of the coating is also made with the lower cost asphalt.